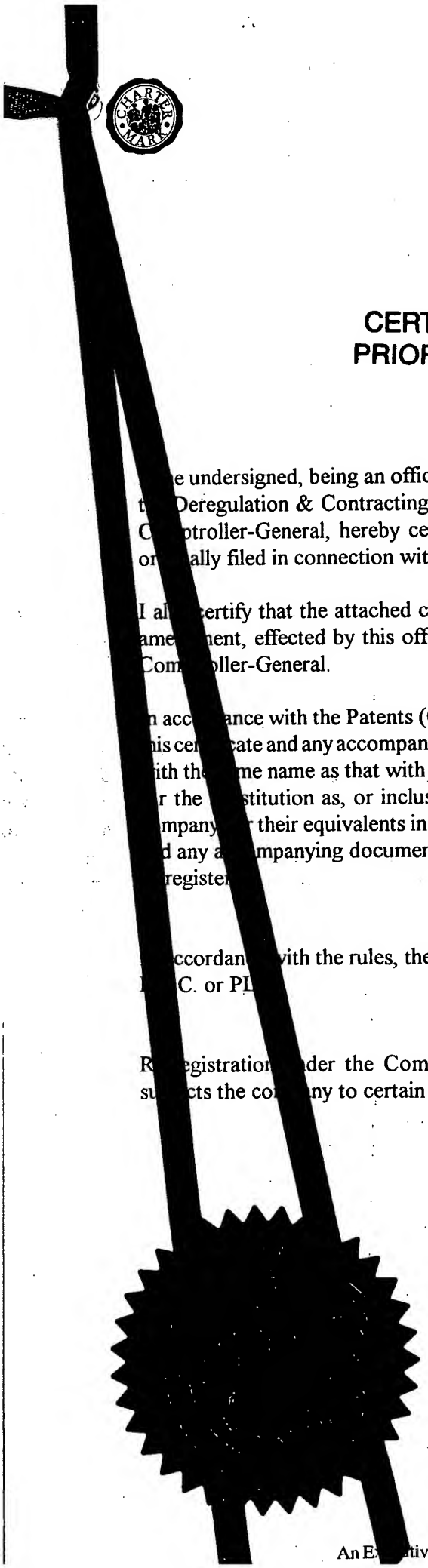

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I al certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an ame ment, effected by this office, following a request by the applicant and agreed to by the Com oller-General.

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Dated 4 May 2004

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REQUEST FOR GRANT OF A P 0118896.0 2 AUG 2001

THE GRANT OF A PATENT IS REQUESTED BY THE UNDERSIGNED ON THE BASIS OF THE PRESENT APPLICATION

I Agent's reference: MILLENNIUM

II Title of Invention: Computer Desk System

III Applicant:
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IV Inventor (b) A Declaration of Inventorship will be filed in due course.

V Name of Agent: M G Harman

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VII Declaration of Priority:

Country	App date	Appln no
GB	26 January 2001	01.02143.5

VIII The Application claims an earlier date under Section 8(3), 12(6), 15(4), or 37(4):
Nil

IX Check List

	A The application contains the following numbers of sheets:		B The application as filed is accompanied by:
1	Request	1 sheet	nil
2	Description	10 sheets	
3	Claims	nil	
4	Drawings	1 sheet + 1	
5	Abstract	nil	

X It is suggested that Figure No of the drawings should accompany the abstract when published

XI Signature:

D.S. ARSCOTT
S.R BROOKS
} DIRECTORS, For the Applicants

Computer Desk System

The present invention relates generally to desk systems for supporting computers.

Desk systems for supporting computers are well known. A typical desk system comprises a main desktop and, often, various drawers and cupboards, possibly with one or more of the drawers being intended to carry the computer keyboard and some other part of the computer system. This may even include the situation where the whole of the central processing unit chassis is hidden away within the desk rather than positioning it on the desktop or on the floor adjacent or under the desk. In some situations, e.g. educational establishments, there will be one or more rows of desks, each carrying a respective computer. In that situation, the desks will usually need to be physically connected together. It will also then usually be necessary to provide power cabling to the various computers, and often also network cabling, connecting the computers to each other and to other devices such as printers and servers.

It is sometimes the case that computer equipment is physically abused, either deliberately or accidentally. The value of computer systems makes them a target for theft; trailing cables and a floor located chassis offer the opportunity for accidental damage.

A major difficulty of desktop systems is the very fact that they sit on the desktop, taking up valuable desktop space for other activities such as paper based ones. With the computer chassis and VDU both on the desktop, a person working at the desktop effectively has their line of sight cut-off in front of them. This is particularly a problem in educational environments where both teacher and pupil can work more effectively if they have visual contact.

The cost of separate computer and desk solutions inevitably produces diseconomies resulting from the employment of products from industries that have traditionally remained separate. A computer desk usually starts from the premise that there is a table to which a computer and cabling is added. This is an uneconomic method of providing an integrated computer and desking system.

Another difficulty with current computer desking systems is the clutter that occurs on the desktop caused by computer peripherals, such as keyboard, mouse and VDU. This clutter is detrimental to the use of such desks for non-computing activities such as paperwork.

Existing computer desking systems also suffer from over-complexity in their set-up and in their use. Setting-up will typically require the initial installation of the desk, then cabling for power and networking, and finally the installation of the computer system and connection to the cabling. In use, any faults with the computer will often then require a certain degree of cable disconnection and component dismantling in order to take the computer chassis away for servicing or repair. This is time-consuming and disruptive.

The general object of the present invention is to provide an improved computer and desking system that addresses the current difficulties of efficiently, effectively, and economically, bringing desking and computer systems together in networked situations.

According to the invention there is provided a computer desk system comprising: a desk consisting of a desktop and a chassis mounted below the desktop; a sliding cassette inserted into the front of the chassis and containing at least a central processing unit; and a power distribution system mounted beneath the desktop and within the chassis from one end to the other, connected

to the cassette and connectable to similar adjacent desks at either or both side(s).

The desk preferably has legs which screw into sockets located within the chassis. The desk preferably also includes recess means for receiving a keyboard, a mouse, and/or a VDU.

The power distribution system preferably comprises split power cabling providing a connection between the two ends of the desk and also to the cassette. The power may be a low voltage system, in which case the computer units may use the power directly; the low voltage will be provided by a mains powered transformer unit coupled to one end of the sequence of power distribution systems in the line of desks. Alternatively, the power may be a mains type system (AC, and 100 V or 230 V). In this case, the cassette may include a power unit, or a power unit may be incorporated in the chassis as part of the power distribution system of the desk, located so that the cassette can plug into it.

Further features of the invention will become apparent from the following description of a desk system embodying the invention, given by way of example and with reference to the drawings, in which:

Fig. 1 is a top view of the desk;

Fig. 2 is a top view of the desk with the desktop removed; and

Fig. 3 is a front view of the desk.

The system comprises one of more desks 10, and, if appropriate, one or more bridge units 11, as shown in Fig. 1. Each desk has a cut-out 13 at one side and a matching projection 14 at the other side, so that two similar desks can be placed side by side so as to interlock with each other. In addition, the system may include one or more bridge units 11 each having a cut-out 15 and matching projection 16 where appropriate. The bridge units may be linear, i.e.

equivalent to a desk 11 but without a computer, or angle units as shown, with the cut-out 15 and projection 16 on adjacent sides. The bridge units are in effect dummy units which can be included in the system to allow the spacing of the desk units to be increased and/or the line of desk units to include turns. Means (not shown) may be provided for screwing or bolting the units together in addition to the interlocking by projections and cut-outs.

The desks will normally be rectangular (possibly of different widths) and the bridge units will normally be square; however, they may be of any convenient shape, depending on the preferred layout to be achieved. The tops of the desks and bridge units can conveniently be of medium density fibreboard (MDF).

Fig. 2 shows the desk 10 with the desktop removed. In a stand-alone situation, the desk has four threaded mounting sockets 32 at its corners to accommodate the legs 50, and a metal chassis 30 to which the mounting sockets are attached. The legs can conveniently be threaded and are screwed into their mounting sockets. If two or more desks are positioned adjacent to each other, then only the first desk requires four legs and the remaining linked desks each only need two legs, with the end without legs being supported on the part of the chassis 31 exposed by the cut-out 13.

The chassis 30 has an open section at its front edge which accommodates a computer cassette 37 that contains a central processing unit 45. The cassette may also conveniently include and a disc drive unit 43, a floppy disc drive and a CD disk drive and other computer components, subject of course to space limitations within the cassette. Without the presence of any disc drives, the cassette conveniently provides the basis for a "thin client" system where the primary processing and media storage is carried out on a central server which is networked to the cassettes.

Those functions to which user access is required, such as the floppy and CD disk drives, the power-on switch, and possibly some USB ports, are located at the front of the cassette 37. Other functions, such as serial, parallel, and additional USB ports, and speaker and headphone connectors, are located at the back of the cassette 37 and are accessed from the hatch 19. For security purposes, the power-on switch may be located at the back of the cassette and accessed only through the hatch 19. The cassette is lockable against the chassis using a standard key mechanism 39 once the cassette has been fully inserted into the chassis.

The front of the cassette 37 may conveniently be finished with a powder-coated metal fascia 40 and the front of the chassis 30 is finished with a similar fascia 38. The cassette fascia 40 has appropriate cut-outs in it to provide access to the various drives, switches and LEDs. Further, a security cover plate 46 is located in front of the cassette fascia and can be pivoted so that it can be lowered into a position below the cassette. In the raised position, the cover plate will be locked into position using the same locking mechanism as for the cassette 39. The cover plate 46 may have the same finish as the fascias 38 and 40 and will sit flush with the chassis fascia 38 when in the raised position.

The fabrication and servicing of the cassette is made easier by mounting the various drives in a metal cradle 44 which is then easily located into the cassette as a single unit using a minimum number of fixings. The drives may be held in place within the cradle by raised nodules punched into the two sides of the cradle, which then locate into holes at the side of the drives, and/or by inserting a U-shaped channel 42 in between the drives, again with the appropriate nodules on the sides. The centre strip 41 of the channel is made from sprung steel to allow the sides of the channel to be squeezed together to allow the drives to be inserted. Where drives are only required on one side of

the cradle, the other side has a dummy section inserted in order to maintain tension in the centre channel.

When the desk is required to be linked with adjacent desks using a standard power supply (i.e. over 100 V), it uses a system of standard IEC power cables 36 linked together and located beneath the desktop. Each cable comprises a male plug at the left hand end and a female plug at the right hand end. These plugs are for connecting to the cables of adjoining desks, thus creating a continuous power circuit supplying adjoining desks. The IEC power cables are conveniently accommodated within a segregated metal cable channel 33 within the chassis, running between the left-hand edge of the chassis 30 and the beginning of the cassette 37; this ensures easy installation of the cables and protects them from unauthorised access.

The cable is split at a suitable point along its length to provide a third section which also has a female plug on its end. This connects to a power input connector on the back of the power supply unit 34 within the cassette. Importantly, the use of a splitter cable allows one cassette unit to be taken out of the power circuit without other units losing power.

The power supply unit 34 in the cassette 37 provides suitable DC power supplies for the computer components and VDU. Convenient values are +11 V, +5 V, +2.3 V, 0 V, -2.3 V, -5 V, and –11 V. The power supply unit is mains powered and is supplied via the power cables 36. Where a TFT (thin film transistor) unit is used, the power supply unit can also provide power to the VDU using a spare power channel from the power supply unit. If a CRT (cathode ray tube) unit is used, then a standard voltage power supply is used and this is supplied either by an alternative splitter lead that provides an additional link or from an additional power connection at the rear of the power supply unit.

Where a low voltage power supply is used (i.e. any power supply of 100 V or less), a transformer unit 35 (Fig. 2) is used to supply power to the system. This transformer unit is positioned on the wall (or any other convenient place) between a mains power socket and the first desk. This power supply unit needs to be a transformer of a suitable rating to allow transforming the incoming low voltage power to the appropriate voltages for the computing and display components. Instead of the IEC splitter cable, three alternative cables/bus bars (live, neutral, and earth) will be used, with an appropriate specification for the voltage used. Each cable or bus bar will meet at a three-way connector located in the chassis 30 and positioned behind the cassette 37 to facilitate a connection to the power supply unit within the cassette.

It will usually be possible to arrange the desks in such a way that the cable channel 33 allows a continuous route for cables. Rubber grommets (not shown) are preferably provided at the openings at the ends of the cableways in the desks at each side of the chassis 30, so that when two desks are positioned side by side against each other, the two facing grommets compress against each other and therefore protect the cables where they cross the gap between the desks. However, spur and/or ring power cable arrangements are obviously possible using various openings within the chassis 30 for cable entry routes.

A standard computer consists not merely of a CPU and a disk drive unit but also a mouse (not shown), a keyboard (not shown), and a VDU. These units are standard units which are freely located on the desktop as required.

The VDU, where it is of a TFT or other flat screen type, is located on a custom-designed bracket 51 (Fig. 3) mounted on the desk towards the centre at the back, thus providing clearance from the desktop. This bracket allows appropriate movement of the VDU by the user. Various models for the bracket are possible, giving varying degrees of flexibility in the movement of the monitor. The signal and power cables for the VDU are routed via the

hollow tube forming the bracket 51 to the VDU. A suitably robust transparent protective screen can be mounted in front of the VDU if desired. Where the VDU is of a CRT type, then this is positioned on the desktop. Importantly, the desktop for CRT VDU usage needs to be some 200 mm deeper than where a TFT VDU is used. This gives desktop depths of approximately 800 mm and 600 mm respectively.

As an alternative to for the VDU bracket described above, the TFT VDU can be stowably mounted. For this, it is mounted on a gas strut combined with a special guide rail, such that when pressure is applied to the top of the VDU, the unit sinks down on the gas strut to below the desktop, where it locks into position using a pressure catch. The VDU may move along the guide rail either into a vertical position at the back of the chassis or horizontal position within the chassis. In order to accommodate this action, a hatch in the desktop opens and closes. This is achieved by applying pressure to the hatch when it is in a closed position, whereupon a pressure catch releases the hatch and a spring mechanism opens the hatch to its fully opened position, thus allowing the VDU to be stowed away and the hatch to be closed. When the VDU needs to be revealed, then reversing the above action will open the hatch and allow the VDU to rise into an operational position and the hatch to close again.

The signal cable for the mouse runs across the desktop and enters through the desktop via an access hatch 19 (Fig. 1) to one corner of the desktop and into a connector at the back of the cassette 37. This access hatch 19 can conveniently consist of a roughly oval hole in the desktop with a fitting cover 20 having a suitable number of cut-outs 18. One end of the cover 20 rests on a rim inside the hole; the other end has a tongue that is first introduced into a slot in the edge of the desktop within the access hatch. Pressing the access hatch 20 where the rim is not present will therefore cause it to tilt, so that it can be temporarily removed to provide access to the rear of the chassis 30 behind the cassette 37. The cover 20 can be locked to the desktop using a key-operated

catch 12. Not only does the access hatch provide access to cable connections at the rear of the cassette 37, but it also provides a space to stow the mouse if desirable.

The desktop also has a slot 17 for storing the keyboard when it is desired to clear a larger space on the desktop. The signal cable to the keyboard can pass through the slot 17, facilitating stowage of the keyboard.

If desired, network cabling can be associated with the cable channel 33 for networking the computers to a central server. However, infra-red or wireless coupling can be included in the computers, so that such network cabling is unnecessary. Telephone cabling may similarly be provided if desired, subject to a suitable modem being provided either in the cassette 37, in the chassis 30, or on the desktop 10. Furthermore, if the capacity of the cable channel 33 is insufficient for all network cables, then additional cable trunking can be located to the rear of the chassis, either fixed to the chassis or fixed to a wall or similar building component.

It can be seen, therefore, that the desking system as described involves critical relationships between the leg mounting sockets 32, the cable channel 3, the access hatch 19, the keyboard slot 17, and various openings within the chassis for cable entry routes.

The present system considerably eases the installation of computer desk systems, since it uses units which can be prefabricated and need little or no modification on site. Desk units slot together and power cables clip-together to provide a system that is literally 'plug-and-play'. It also reduces the chance of components of the computers being stolen, because the components are largely encased in a lockable cassette and the computer cassette case itself is non-standard, making casual theft less likely. Accidental abuse is significantly

reduced through the robust design of desk components and the encasing of cable and computer components within the chassis.

The desk provides flexible usage, either as computer desk or as an ordinary desktop generally cleared of computer components. The computer desk system provides the opportunity to provide desk, computer, VDU, and cabling more cost effectively, because the production processes involved in the manufacture of the desk components also provide the infrastructure for the other components, such as a case for the computer components, a cable-way for the power, direct connections for both power and networking cables, and a combined power supply unit for both computer and TFT VDU.

The present system is obviously susceptible to numerous modifications and variations. For example, units may have variable height legs and/or fold back against the wall to provide flexible use of space. Where desktops form the end of a run of desks, then the free end of the desktop can be manufactured without a cut-out or projection in order to provide a neat end profile.

The chassis within the unit is also capable of accommodating other technologies than personal computing, particularly where such technologies need to be networked. The computer cassettes are also capable of being accommodated within other pieces of furniture where the concept for their accommodation and operation remain the same.

Claims

Any feature of novelty or combination thereof within the meaning of Article 4H of the International Convention (Paris Convention).

Fig. 1

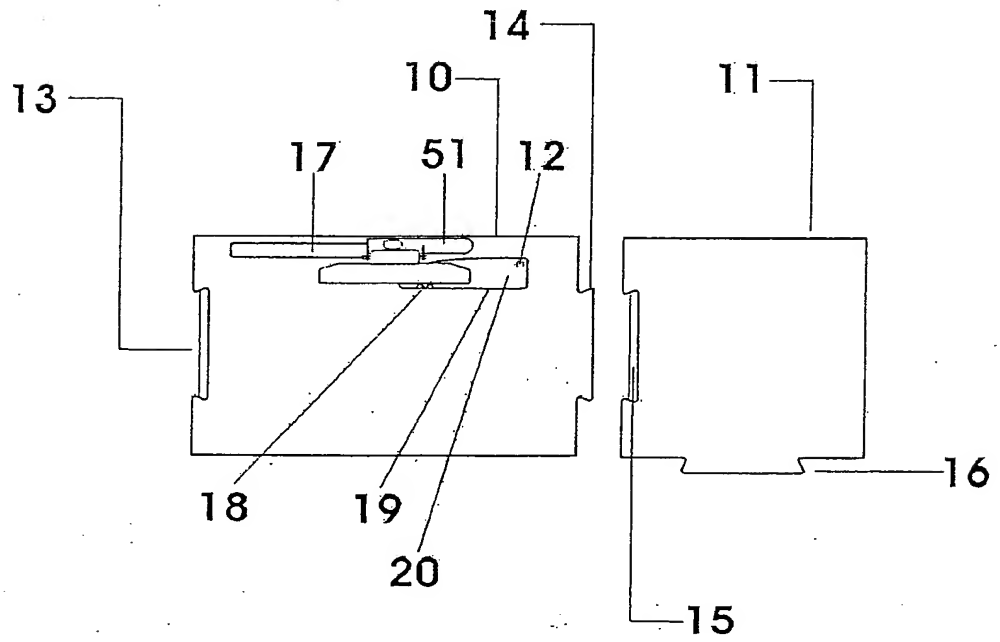

Fig. 2

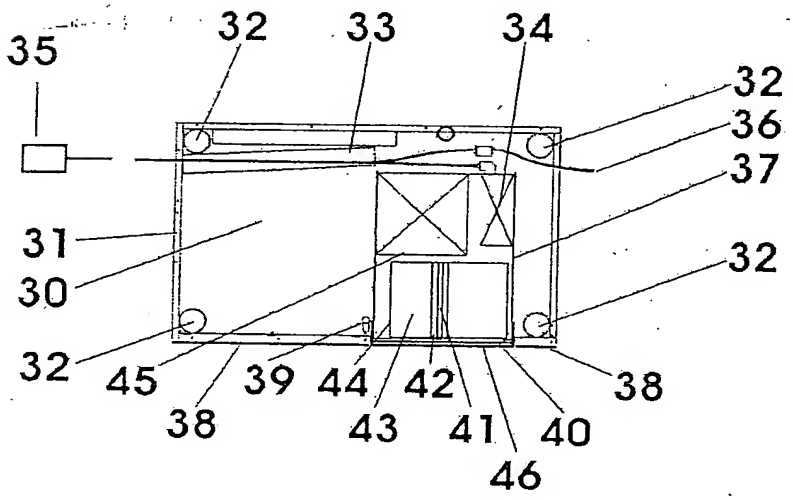

Fig. 3